

REMARKS

Claims 1-16 are pending. Claims 14 and 15 previously were withdrawn in response to a restriction requirement. Claim 1 is currently amended. Support for this amendment can be found, for example, at page 8 of the specification. No new subject matter has been added.

Claims 1-13 and 16 were rejected under 35 U.S.C. §103(a) as unpatentable over Roberts et al. (U.S. Publication No. 2005/0112418) in view of Guthrie et al. (U.S. 5,009,968).

In response to the last Office action (mailed December 4, 2008), Applicant argued that the Roberts publication does not disclose or render obvious a control unit operatively connected to electrical heaters that are disposed near ends of a fuel cell's stacked body or end plates, where the control unit is adapted to operate the electrical heaters (and a water purging device) when a power generation stop command is output, as recited in claim 1. The present Office action appears to concede that Applicant's argument was correct.¹

The present Office action alleges, however, that it would have been obvious, in view of the Guthrie patent, to modify the Roberts fuel cell in a manner that would have produced the claimed subject matter. As discussed below, Applicant disagrees.

The Guthrie patent is directed to a molten carbonate fuel cell assembly 10 that operates at temperatures ranging from 590°C to 700°C. *See* col. 3, lines 8-10 and FIG. 1. The fuel cell assembly 10 includes a stack 12 of fuel cells 14. The end plates of the outermost fuel cells in the stack 12 are thin membranes 16. Beyond each thin membrane 16 is a rigid pressure plate 20, a first section 22 of semi-rigid thermal insulation and a second portion 26 of semi-rigid thermal insulation. An electrical heater 24 is between the first 22 and second 26 portions of semi-rigid thermal insulation. *See* column 3, lines 22-24.

The Roberts publication, on the other hand, relates to solid polymer electrolyte fuel cells that tend to have much lower operating temperatures than molten carbonate fuel cell assemblies,

¹ The Office action states, on page 3, "Roberts et al., do not recite control unit to operate electrical heaters."

which are the subject of the Guthrie patent. Indeed, the Roberts publication itself explains that normal stack operating temperatures are “about 85°C” and that increased stack operating temperature are only “approximately 100°C.” *See ¶ [0002] and ¶ [0013].*

The electrical heaters in the Guthrie patent are provided to help prevent excessive fluctuation in the operating temperature and thereby prevent thermal shock or rapid increases in electrical resistance at the end cells of the assembly. *See col 1, line 52 – col. 2, line 4.* Since the solid polymer electrolyte fuel cell disclosed in the Roberts publication operates at much lower temperatures than the molten carbonate fuel cell disclosed in the Guthrie publication, preventing thermal shock and rapid increases in electrical resistance at the assembly’s end plates is not a concern in the Roberts publication. Accordingly, a person of ordinary skill would have had no reason to apply portions of the Guthrie disclosure that relate to the electrical heaters to the fuel cell disclosed in the Roberts publication.

Indeed, the Roberts publication itself explains that the electrical heaters are provided for a very different reason from the electrical heaters in the Guthrie patent (*i.e.*, reducing the amount of water remaining within the passages of the stack). *See Abstract of the Roberts publication.* Due to the high operating temperatures of the molten carbonate fuel cell assembly disclosed in Guthrie, reducing water in the stack is not likely a significant problem.

Claim 1 should be allowable for at least the foregoing reasons.

Claim 1 should be allowable for the following additional reasons as well.

Claim 1 recites that the control unit is adapted to operate the electrical heaters and the water purging device when a power generation stop command is provided as an output. Neither the Roberts publication nor the Guthrie patent, alone or in combination, discloses or renders obvious the claimed subject matter.

The Office Action, at page 3, appears to allege that, in view of the Guthrie disclosure, it would have been obvious to insert electrical heaters near the ends of Roberts' fuel cell stack and to operate these electrical heaters along with the purge system 250 disclosed in the Roberts publication when the stack is shut down because doing so would minimize rapid temperature

changes at the ends of the stack that might otherwise occur during cool down and cause distortion.

As discussed above, however, the solid polymer electrolyte fuel cell disclosed in the Roberts publication operates at much lower temperatures than the molten carbonate fuel cell assembly 10 disclosed in the Guthrie patent. Nothing in the cited references indicates that minimizing rapid temperature changes at the ends of the stack that might otherwise occur during cool down and cause distortion would be a concern at these lower operating temperatures. Therefore, the reasons proffered in the Office action for modifying the references in this manner are unsupported by the record.

Claim 1 should be allowable for the foregoing reasons as well.

Claims 2-13 and 16 depend from claim 1 and, therefore, should be allowable for at least the same reasons as claim 1.

It is believed that all of the pending claims have been addressed. However, the absence of a reply to a specific rejection, issue or comment does not signify agreement with or concession of that rejection, issue or comment. In addition, because the arguments made above may not be exhaustive, there may be reasons for patentability of any or all pending claims (or other claims) that have not been expressed. Finally, nothing in this paper should be construed as an intent to concede any issue with regard to any claim, except as specifically stated in this paper, and the amendment of any claim does not necessarily signify concession of unpatentability of the claim prior to its amendment.

No fee is believed to be due. Please apply any charges or credits to Deposit Account No. 06-1050, referencing Docket No. 15682-0003001.

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Respectfully submitted,

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